

entirely hypothetical series of upward and downward movements. These are unnecessary if we can be convinced that coral-reefs grow up independent of terrestrial movements, which may in one area be in an upward, in another in a downward direction. From this point of view the reefs stand up as the result of a complex series of agencies, among which the more important are on the one hand, the temperature, solvent power, currents, tides, and waves of the sea, and on the other hand, the amount and direction of the supply of pelagic food, the up-building of calcareous deposits to the zone of reef-builders, the outward vigorous growth of the coral-masses and their decay and death, and the solution of their skeletons in the inner parts of the reefs. All these causes are known and visibly active. Without the cooperation of any other supposed or latent force they appear to be entirely adequate to the task of building up the present coral-reefs of the oceans.

ARCH. GEIKIE

DR. JOHN LAWRENCE LECONTE

INFORMATION has just been received in this country announcing the death of Dr. LeConte. He was born in New York on May 13, 1825, and was the son of a distinguished officer in the United States army, himself an entomologist. He adopted the medical profession, and during the secessionist war he entered as medical officer of volunteers. The foregoing necessarily brief, specially biographic account is chiefly derived from information furnished in Dimmock's "Special Bibliography of American Entomologists, No. 1."

LeConte could have been only nineteen years old when he published his first entomological paper on certain new species of North American *Coleoptera* (*Proceedings of the Academy of Natural Sciences of Philadelphia*, vol. ii.). From that time forward a continuous series of works and papers on North American *Coleoptera* was produced by him until his death. He made a speciality of *Coleoptera*, and, with few exceptions, all his writings were devoted to that order of insects, and through his exertions the beetles of the United States are now almost as well known as are those of Europe. At the time of his death his published papers must have been nearly 200. Moreover he was the acknowledged authority in the United States on all matters coleopterological, a position which must naturally have caused him vast trouble and correspondence, sometimes with inadequate results. Latterly he worked greatly in company with Dr. G. H. Horn, of Philadelphia, a worthy follower of his tutor and a worthy successor. Their joint labours culminated *this year*, when was published ("Smithsonian Miscellaneous Collections," No. 507) a "Classification of the *Coleoptera* of North America," a volume extending to nearly 600 pages. It is needless here to refer to the revolution this work and other memoirs (chiefly by Dr. Horn) created in the minds of coleopterists as to the sequence of main divisions, &c. All working entomologists are sufficiently alive to the importance of the new ideas put forth. In fact this volume might have been considered a model of a special monograph were it not for a somewhat crude "Introduction" on insects in general that precedes the systematic portion.

In the present condition of entomological science in the United States the loss of Dr. LeConte seems almost irreparable. He and his coadjutor, Dr. Horn, and one or two others, stood almost alone amongst the prominent American entomologists in holding no special official position in connection with their subject.

LeConte once made a lengthy stay in Europe, and was well known personally in this country to all the prominent Coleopterists. Moreover he was honorary member of several of the European entomological societies, including the Entomological Society of London; his personal friends in this country were numerous. Since the death of

Say (whose scattered works were carefully collated and edited by the subject of this notice) entomological science in America has not had to deplore so severe a loss, and Say's death was not fraught with the same significance.

R. McLACHLAN

THE LATE MR. DARWIN ON INSTINCT

AT the meeting of the Linnean Society this evening (December 6) a highly interesting posthumous paper on Instinct, by Charles Darwin, will be read and discussed. We have been favoured with an early abstract of the same, which we here present to our readers.

After detailing sundry facts with reference to the migratory instincts of different animals, Mr. Darwin proceeds to suggest a theory to account for them. This theory is precisely the same as that which was subsequently and independently enunciated by Mr. Wallace in *NATURE*, vol. x. p. 459. Thus, to quote from the essay: "During the long course of ages, let valleys become converted into estuaries, and then into wider and wider arms of the sea; and still I can well believe that the impulse [originally due to seeking food] which leads the pinioned goose to scramble northward, would lead our bird over the trackless waters; and that, by the aid of the unknown power by which many animals (and savage men) can retain a true course, it would safely cross the sea now covering the submerged path of its ancient journey."

The next topic considered is that of instinctive fear. Many facts are given, showing the gradual acquisition of such instinctive fear, or hereditary dread, of man, during the period of human observation. These facts led Mr. Darwin to consider the instinct of feigning death as shown by sundry species of animals when in the presence of danger. Seeing that "death is an unknown state to each living creature," this seemed to him "a remarkable instinct," and accordingly he tried a number of experiments upon the subject with insects, which proved that in no one case did the attitude in which the animal "feigned death" resemble that in which the animal really died; so that the instinct really amounts to nothing else, in the case of insects at all events, than an instinct to remain motionless, and therefore inconspicuous, in the presence of danger. From the facts given with regard to certain vertebrate animals, however, it is doubtful how far this explanation can be applied to them.

A large part of the essay is devoted to "Nidification and Habitation," with the object of showing, by an accumulation of facts, that the complex instincts of nest-building in birds and of constructing various kinds of habitations by mammals, all probably arose by gradual stages under the directing influence of natural selection.

The essay concludes with a number of "miscellaneous remarks" on instincts in general. First the variability of instinct is proved by sundry examples; next the fact of double instincts occurring in the same species; after which, "as there is often much difficulty in imagining how an instinct could first have arisen," it is thought "worth while to give a few, out of many cases, of occasional and curious habits, which cannot be considered as regular instincts, but which might, according to our views, give rise to such." Finally, cases of special difficulty are dealt with; these may be classified under the following heads:—(1) Similar instincts in unallied animals; (2) dissimilar instincts in allied animals; (3) instincts apparently detrimental to the species which exhibit them; (4) instincts performed only once during the lifetime of an animal; (5) instincts of a trifling or useless character; (6) special difficulties connected with the instinct of migration; (7) sundry other instincts presenting more or less difficulty to the theory of natural selection.

The "Conclusion" gives a summary of the general

principles which have been set forth by the whole essay. This, therefore, we shall quote *in extenso*:—

"We have in this chapter chiefly considered the instincts of animals under the point of view whether it is possible that they could have been acquired through the means indicated on our theory, or whether, even if the simpler ones could have been thus acquired, others are so complex and wonderful that they must have been specially endowed, and thus overthrow the theory. Bearing in mind the facts given on the acquirement, through the selection of self-originating tricks or modification of instinct, or through training and habit, aided in some slight degree by imitation, of hereditary actions and dispositions in our domesticated animals; and their parallelism (subject to having less time) to the instincts of animals in a state of nature: bearing in mind that in a state of nature instincts do certainly vary in some slight degree: bearing in mind how very generally we find in allied but distinct animals a gradation in the more complex instincts, which shows that it is at least possible that a complex instinct might have been acquired by successive steps; and which moreover generally indicate, according to our theory, the actual steps by which the instinct has been acquired, in as much as we suppose allied instincts to have branched off at different stages of descent from a common ancestor, and therefore to have retained, more or less unaltered, the instincts of the several lineal ancestral forms of any one species: bearing all this in mind, together with the certainty that instincts are as important to an animal as their generally correlated structures, and that in the struggle for life under changing conditions, slight modifications of instinct could hardly fail occasionally to be profitable to individuals, I can see no overwhelming difficulty on our theory. Even in the most marvellous instinct known, that of the cells of the hive-bee, we have seen how a simple instinctive action may lead to results which fill the mind with astonishment.

"Moreover, it seems to me that the very general fact of the gradation of complexity of instincts within the limits of the same group of animals; and likewise the fact of two allied species, placed in two distant parts of the world and surrounded by wholly different conditions of life, still having very much in common in their instincts, supports our theory of descent; for they are explained by it: whereas if we look at each instinct as specially endowed, we can only say that it is so. The imperfections and mistakes of instinct on our theory cease to be surprising: indeed it would be wonderful that far more numerous and flagrant cases could not be detected, if it were not that a species which has failed to become modified and so far perfected in its instincts that it could continue struggling with the co-inhabitants of the same region, would simply add one more to the myriads which have become extinct.

"It may not be logical, but to my imagination it is far more satisfactory, to look at the young cuckoo ejecting its foster-brothers, ants making slaves, the larvæ of the Ichneumonidæ feeding within the live bodies of their prey, cats playing with mice, otters and cormorants with living fish, not as instincts specially given by the Creator, but as very small parts of one general law leading to the advancement of all organic bodies—Multiply, Vary, let the strongest Live and the weakest Die."

PORTO RICO

THROUGH the courtesy of Sir Joseph Hooker, we are able to publish the following interesting communication from Baron Eggers on the island of Porto Rico:—

St. Thomas, October 22, 1883

DEAR SIR JOSEPH HOOKER,—It is a long time since I wrote you last. I have meanwhile at last accomplished

my long-cherished design, partly at least, of exploring the Luguillo Mountains in Porto Rico, which island I visited during April and May this year.

I spent about five weeks there, living for some time in the hut of a "fibaro" or native labourer on the Sierra, at an altitude of about 2200', on the edge of the primeval forests that still cover all the higher part of the mountain range.

Since my return I have been busy arranging my collections, the greater part of which appears in the ninth and tenth century of my "Flora Indiæ Occidentalis Exsiccata."

As for the general character of the Sierra forests, they of course resemble in their main outlines those of the other West India Islands. There is, however, especially one feature that strikes me as being peculiar to this mountain ridge compared with the woods of other islands, for example, of Dominica. Whilst the climate is just as moist in the Sierra of Porto Rico as in that of Dominica, the forests of Porto Rico seem nearly entirely *destitute of epiphytes* with the exception of some few Bromeliads and a very rarely occurring stray orchid. But orchids in general and epiphytical ferns, such as *Trichomanes* and *Hymenophyllum*, &c., are conspicuous by their absence. Of palms I found but one species, which I have distributed in my "Flora," I believe it is a *Euterpe*, grows gregariously at an altitude from 1500' to 3000'. No Cycads were seen at all.

On the other hand, I found several interesting trees, especially a beautiful *Talauma*, with immense, white, odorous flowers and silvery leaves, which would be very ornamental. The wood is used for timber, and called Sabino. A *Hirtella* with crimson flowers I also found rather common; it is not described in any of Grisebach's publications. An unknown tree with beautiful, orange-like foliage, and large, purple flowers very similar in shape to those of *Scaevola Plumieri*, split along one side, a tall *Lobeliaceæ*, a large *Heliconia*, nearly allied, it seems, to *H. caribbæa*, Lam., and several other as yet undetermined trees and shrubs, are among the most remarkable things found.

On the whole I was somewhat disappointed with regard to the result of the voyage, as I had expected a greater number of novelties, as well as a richer vegetation in general, at least something like the Caribbean Islands. But these partly negative results may no doubt be of some value also in forming an idea of the West Indian flora in general. Of tree-ferns, *Cyathea Serra* and an *Alsophila* were not uncommon.

One of the most conspicuous trees in some parts is the *Coccoloba macrophylla*, which I found on my first visit to Porto Rico. This tree is found up to an altitude of 2000', but chiefly near the coast, where it forms extensive woods in some places, which at the time of flowering, with immense, purple spikes more than a yard long, are very striking. The tree is named Ortegón by the inhabitants; it does not seem to occur on any of the British islands, but to be confined to Porto Rico and Hayti; at least I do not see it mentioned in Grisebach's "Cat. Plant. cubensium."

The people cultivate sugarcane in the plains, which are very fertile, yielding three hogsheads on an average per acre without any kind of manure. Besides this staple produce, a very good coffee is produced; it does not appear that any blight has as yet perceptibly affected the shrubs here. Rice is very commonly cultivated on the hills in the Sierra. I suppose it must be a kind of mountain variety, as no inundation or other kind of watering is used. Rice is in fact the staple food of the labourers, together with plantain and yaüdia, *i.e.* *Caladium esculentum*. Immense pastures of *Hymenachne striatum* (Malahojilla) occupy a part of the lowland, and feed large herds of cattle of an excellent quality. St. Thomas and the French islands all obtain their butcher's meat from